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James Bartram, Jr.  
AN

INAUGURAL DISSERTATION

ON

*Gangrene and Mortification,*

SUBMITTED TO THE EXAMINATION OF

THE REV. JOHN EWING, S. T. P. PROVOST;

THE

*Trustees and Medical Faculty of the University of  
Pennsylvania,*

ON THE 12TH DAY OF MAY, 1797.

For the Degree of Doctor of Medicine.

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By FRANCIS K. HUGER,

OF SOUTH CAROLINA.

————— Ut fi  
Cœcus iter monstrare velit. HOR



*Philadelphia:*

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1797.



TO  
PHILIP S. PHYSICK, M. D.

*One of the Physicians of the Pennsylvania Hospital,*

*THIS Dissertation is inscribed, as a  
small tribute of respect for his talents,  
and as a mark of regard and esteem ;  
by his sincere friend,*

F. K. HUGER.

For

Dr. Barton

With best respects from the  
Author

Presented to Lieut. George Spackman  
By William A. Barham

ON

## *Gangrene and Mortification.*

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IN writing a dissertation pursuant to the rules of the University, I have sensibly felt how difficult it is to ascertain what we really know, and how much is requisite to be known before we can form an opinion, or venture to affirm a judgment. To one just finishing a course of medical education, the greater number of facts from which the principles of the science are deduced rest upon authority, and frequently his judgment rests upon no better foundation. The opinions then advanced in the following dissertation are to me only conjectures, and the conclusions drawn only probabilities.

Two motives have induced me to fix upon the subject of Gangrene and Mortification. First, it appears to me that Mr. John Hunter's Experiments and opinions of Inflammation lead to a rational explanation of the disease; and, secondly, I have seen some

cases which I think verify his theory. To this I may add, that deriving from Mr. Hunter the earliest ideas of my profession, in treating a subject elucidated by him, I feel gratified in paying a public tribute of admiration to his genius, and of respect to his memory ; and while I offer this dissertation as a proof to the Trustees and Professors I have not mispent my time, I feel animated with the hope that in following his ideas I may be led to the pursuit of truth.

We find Gangrene very early taken notice of by the ancients. It seems difficult however to form a clear idea of their opinion of this disease. Hippocrates speaks of a sphacelus of the brain, which he says very few get over \*. Galen defines a Gangrene, “when a part from violent inflammation is not absolutely dead but about to die†.” Celsus appears to use the terms Cancer and Gangrene indifferently‡.

The moderns have more diligently investigated this subject.

The thirst of knowledge and spirit of inquiry which have so eminently promoted the improvement of science in general for the last century, have had

\* De Morb. Lib. 1. Cap. 7. † Æginita, Lib. 4. Cap. 19.

‡ Celsus, Lib. 6. Cap. 26.

considerable influence on the science of medicine. Modern Physicians appear to have investigated with unremitting ardour the causes of the effects they observed, and have been unwilling to admit any mode of practice which was not founded on reasoning as well as observation. The frequent difficulty however of ascertaining the different operations of the human machine, has led men of ingenuity and of warm imagination to substitute suppositions for what they could not establish, and upon such uncertain data they have formed theories, which by their novelty or brilliancy have attracted attention and commanded admiration. Hence medicine became as much a science of the imagination as of reasoning, and the different systems which have successively been in vogue and exploded prove the uncertain foundation on which they were built. Nevertheless, in these investigations many facts have been brought to light, and many important observations made, and in ascertaining the fallacy of preceding conjectures they have facilitated the future progress of the science.

These reflections naturally suggest themselves on viewing the opinions entertained of Gangrene and Mortification by modern authors, and the mode of treatment they recommend.

In their investigations on this subject, they appear to have considered the living animal machine as

composed of matter in a state for chemical inquiry, and to have totally overlooked that property which every animal possesses so long as it is alive of taking on peculiar actions from the application of stimuli, and which is absolutely incompatible with the changes they supposed.

They have uniformly concluded that the fluids circulating in the human body were capable of becoming highly acrimonious, and the body itself of being eroded by these humours \*; that stagnation produced putrefaction, and that putrefaction destroyed †. To counteract this it has been advised “to prevent the return of putrid matter into the  
“veins by increasing the motion of the blood ad  
“extra ‡;” to evacuate the acrid humours by scarifications so as “to form outlets by which the  
“corrupted humours may be expelled from within,  
“and a passage given to remedies which correct the  
“present putrefaction and prevent the future §.” Those remedies are such as “by preserving or as it  
“were pickling the parts they may resist a putrid  
“state ||.” Among these are salt, vinegar, and

\* Boerhaave. Aph. 423. Quesnay. Taité de la Gangrene. Cullen's First Lines, cclii.

† Van Swieten's Com. Sect. 423. Quesnay. Cullen's First Lines, cclv.

‡ Boerhaave. Aph. 435. § Van Swieten's Com. Sect. 435.

|| Boerhaave. Aph. 437.

wine, “because beef is preserved with salt, and  
 “boar’s flesh in Germany with wine\*.” They have  
 taken for granted that the vital powers were either  
 impaired or were languid and inactive, and recom-  
 mend to increase the motion of the blood, and “to  
 “rouse and animate the languid and almost extin-  
 “guished vital principle †.” Aromatic substances  
 were thought eminently congenial to life; “that the  
 “subtle and fragrant parts pass immediately with the  
 “venal blood into the heart, and from thence by  
 “the arteries are distributed throughout the body.  
 “Hence a sudden refreshment or increase of strength  
 “follows, inasmuch as the spirits and powers of the  
 “heart are excited by these most grateful stimuli ‡.”  
 Observing also that a mortified part was in some  
 cases spontaneously separated from the living, and that  
 this operation was attended with some inflammation,  
 it was concluded that a considerable flow of blood  
 was necessary to effect it, and hence cupping glasses  
 were thought of use “to increase the quantity and  
 “impetus of the vital humours, and thus the fibres  
 “which connect the gangrenous with the sound part  
 “are at the same time dissolved so as to procure a  
 “separation of them §.”

\* Van Swieten’s Commentaries, Sect. 438.

† Quesnay, *Traité de la Gangrene*. ‡ Van Swieten, *Com.*

§ Van Swieten’s Commentaries, Sect. 435.

It appears sufficient to have noticed these prevailing opinions, without entering into a particular examination of them. The imagined consequences of stagnation are now known to be erroneous, and the putrefaction of the blood in the living animal has been disproved\*. The formation of pus and its properties, the removal of parts of the body by inherent powers totally independent of chemical or mechanical causes, have been sufficiently explained and illustrated in a very late publication†.

It was observed that living matter possessed properties which essentially distinguished it from matter in a state for chemical inquiry, and upon which all the actions of a living animal depend. To this essential property of living matter we can alone attribute the actions of an animal in health; and as indeed every effect which takes place in living matter seems to depend upon it, we must attribute to it also the actions of an animal in disease.

The animal machine is composed of a variety of different parts all tending to the same ultimate effect, the preservation and continuation of the machine. To produce this there must be a succession of actions, the preceding being the cause of a succeeding one. Action is either healthy, disordered, or diseased.

\* Seybert's Inaugural Dissertation, 1793, Philadelphia.

† Treatise on the Blood and Inflammation, by John Hunter.

Healthy action is the perfect and easy performance of the functions of the machine. Disordered action, is an action of restoration tending to remove or counteract whatever impedes healthy action. Diseased action tends always to destroy the animal machine. Hence Inflammation which arises from a simple injury, being an operation to answer some good purpose is not considered as a disease, though it frequently produces derangement in the animal œconomy.

The discrimination made by many authors between Gangrene, and Sphacelus or mortification, does not appear to me clear, as it cannot be accurately ascertained when Gangrene terminates or mortification commences. They uniformly have been regarded as different stages of the same disease; but as no advantage appears to arise from a division of this nature in the view I take of the subject, I beg leave to consider them as synonymous.

For the support of the animal machine, it is absolutely necessary that successive changes of fresh blood be carried to its different parts. If the circulation is cut off, and the part deprived of this support, it will lose all sensation and action, and be separated from the rest of the body. This effect is so universally known, that we see barbarous and uncivilized peo-

ple availing themselves of it. The women of New Holland have a custom of removing the first joint of their little finger by tying a hair tight round it.—A tumour pressing on an artery, has been known to produce the same effect\*.—Great violence frequently destroys all sensation and action, and is followed by loss of the part.—Intense cold also produces the same effect. The nose, ears, and fingers of the inhabitants of northern nations, are sometimes lost in this way. This total extinction of sensation and action in a part, may be considered as death of the part, and is what I understand by Gangrene or Mortification.

It has been long known that there is a system of vessels in the human body called absorbents, which take up nourishment from our food, absorb fluids extravasated in the body, and sometimes produce a wasting of the animal itself. It seems also ascertained, that they have a power of removing bone and parts of the body which are no longer necessary, and that their operations and uses are very considerable, and very important in the animal œconomy.

When a part then is dead or mortified, it affects the surrounding substance as an extraneous body, giving an irritation which excites an action in the

\* Hildanus de Gangrena. Cap. 113.

abforbents to get rid of it. The first effect of the irritation is a slight inflammation, and soon after follows a breach of continuity with irregular edges moistened with a thin fluid discharge. This goes on till all the dead part is detached, which falls off and leaves a sore or ulcer. Another intention is now to be fulfilled, the restoration of the part destroyed. Other operations or actions therefore take place. Inflammation continues, suppuration is produced, or a particular fluid is formed called pus, which appears to be a leading step to the formation of new parts called granulations. So that pus far from detaching a dead part either mechanically, by dissolution, or by corrosion, seems to precede the formation of a new one; and that it does not possess the properties which have been generally attributed to it, has been proved by a series of experiments to ascertain that point\*. It does not indeed appear any way accessory to the removal of parts, very frequently no pus being formed, and when there is, it would seem to be from the healing and ulcerative process going on in the same sore at the same time.

When therefore a dead part is removed and an ulcer formed, little more is to be done than not to interfere with the process of restoration when that

\* Home on the Properties of Pus.

goes on readily. It sometimes however happens that the absorption of the living part or ulceration continues. The treatment in this case will be taken notice of when we mention the treatment of what is next to be considered, Mortification preceded by Inflammation.

The different parts of which an animal is composed have very different powers of growth, and possess different capacities of action in health and in disease. The bones are more easily destroyed than the soft parts, and in their operations of restoration are much slower. Tendons and ligaments are more easily destroyed and more slowly repaired than muscle. Upon the whole, it would appear that the capacity of action of a part is in proportion to the number of blood-vessels it contains. Situation also has some influence, for it is observed, that the actions of similar parts go on less actively at the extremities than near the source of circulation. Hence, parts having little blood, or at the extremities being less capable of going through the actions of restoration, are more readily destroyed in consequence of injuries. For when inflammation takes place and proceeds to a considerable height, the action may be so violent as to exhaust the power of the part and thus produce death. The first appearance of this effect is the

inflammation becoming of a watery kind, and having in some degree a determined edge. Then livid spots appear with considerable vesication, containing a bloody fluid. There is at the same time great pain, similar to that of burning. The part first affected becomes perfectly black, and is thrown off in the form of a slough, leaving an ulcer. All these appearances advance in progression, which Celsus has very accurately and concisely described. “Ulcus in locum  
 “pustulosum, pustulæ in eum qui pallet aut livet,  
 “pallor aut livor in id quod inflammatum est, inflam-  
 “matio in id quod integrum est transit\*.”

If it be true that mortification is a consequence of actions, being excited in a part so violent as to exhaust the principle on which action depends, the common treatment in such cases must appear injudicious. This seems to have consisted in administering medicines termed tonics, and cordials to remove the debility, and in applying the most stimulating and sometimes corroding substances to rouse the living part or get rid of what was dead; all which is adding stimulus upon stimulus to parts already weakened by having been made to act to the full stretch of their capability. The consequence of such treatment may be easily conceived; the principle of action of the part must

\* De Med. Lib. v. Cap. 26.

be diminished by degrees, and at last totally annihilated, and the disorder must spread with rapid progress. I have myself seen instances of parts of the body probably lost in this manner, and the candour of several Physicians afford cases of their failure when they have followed such a practice. These become lessons of the most instructive kind, and I shall select from Mr. La Motte, a very marked and striking case. A woman who had been long sick was attacked with a gangrene near the os coccygis. I made, says Mr. La Motte, some slight scarifications with a view to stop its progress. The gangrene nevertheless spread daily, although I repeated the scarifications in proportion, even made a considerable incision round the circumference of the gangrene, and bathed the parts with a decoction composed of two species of the aristolochia, myrrh, aloes, white wine, sugar and brandy, applying to the part a plaster of styrax, and a compress steeped in aromatic wine. These attentions which apparently should have relieved the patient, had no effect in retarding the progress of the gangrene, which spreading over the whole glutei muscles, induced me to remove the flesh in great quantity in order to separate the dead from the living parts, as I had been taught to do by Mr. Petit, formerly Surgeon of the Hotel Dieu. This prevented the poor woman from supporting herself on

her back, and obliged her to turn a little to one side or the other. This increased the disorder ; for the change of position caused a mortification of the part pressed, so that I was obliged to make more scarifications ; which were so frequently repeated, that the os coccygis, the greater part of the sacrum, the two trochanters, and a part of each ilium were entirely laid bare by the quantity of stinking and putrid flesh which I removed, thinking myself obliged to do it with a view to imitate my instructor as nearly as I could on this occasion. Nor did the lotion above mentioned, or the tinctures of aloes and myrrh more than the unguent. egyptiac. alone or dissolved in brandy, which I made use of during the whole time the poor woman was in this miserable state, prove of any service, as she died denuded in the manner I have mentioned. It would be unjust not to add Mr. La Motte's reflection on this case. " It is not only, " says he, in the Hotel Dieu of Paris, that this improper treatment prevails, but I have seen it practised " in the country with as little success. I may indeed " affirm, it is a fatal error which I have taken care " never to commit since \*."

It would be easy to recite many instances where a similar mode of treatment has failed, since scarcely an author has practised it without meeting cases of

\* Observ. 298, et suiv.

this kind. They have therefore almost all laid down exceptions to their general practice which have been the result of experience. It is upon facts corresponding to these, added to a more accurate knowledge and observation of the structure and functions of the human body, that opinions are founded essentially differing from them. What they considered as exceptions to their doctrine, appear so numerous and general as to become in part the foundation of new doctrines, which possess the advantage of being supported by the observations of ancient as well as modern observers.

Some of their exceptions and cautions would almost apply as general rules, if the idea I have stated be just. Celsus says, “ During the progress of the “ disorder, no medicines are to be administered which “ excite the formation of pus\*.” Van Swieten himself, though supposing that a gangrened part is separated by the pus, and that pus is formed by accelerating the circulation and by warm applications has these words : “ No circumstance more frequently “ produces a gangrene than the application of such “ substances as by their stimulating acrimony increase “ the motion in the part affected, and more especially if the circulation be accelerated by the use of “ similar medicines internally given. To this cause

\* De Med. Lib. v. Cap. 26.

“ has been owing the fatal event often seen in  
 “ inflammatory diseases, where the chemists have  
 “ thrown down such plentiful doses of their oily  
 “ volatile salts and other sharp medicines of a similar  
 “ nature under a pretence of extenuating ; as also  
 “ from the outward applications which the surgeons  
 “ have made of spirit of sal. ammon. alcohol, &c. to  
 “ such parts as have been inflamed \*.”

This perfectly accords with the idea stated, that mortification arises from the powers of the part being inadequate to carry on the action excited. Van Swieten mentions also that Dr. Boerhaave prevented a mortification in the great toe of a magistrate from spreading for full six months by applications that kept it from putrefaction, and by recruiting the patients spirits with nourishing food and cordials. But when upon a consultation with other Physicians, it was judged adviseable by a majority of voices to attempt the separation of the mortified part from the sound by suppuration, and to this purpose ripening cataplasms were applied, in three days time the mortification ran up as high as the thigh, and the patient gently expired a short time after †.

These facts and observations tend to corroborate the opinion I have advocated, and it appears some-

\* Van Swieten's Com. Sect. 422.

† Ibid. Sect. 426.

what extraordinary that substances which, if applied to a sound and healthy part, would excite considerable inflammation should be imagined to have salutary effects when applied to an inflamed part. We see however Mr. Quesnay recommending muriated quicksilver and muriated antimony for a gangrene, and Aymard, a celebrated surgeon, applying salt, vinegar, brandy, ung. egypt. and corrosive sublimate mixed together. These substances would doubtless excite violent inflammation in a sound part, and frequently I believe cause mortification when applied to an inflamed part. Applications of this nature however are not uncommon, and under the name of cleansing and digesting foul ulcers, still continue to torture the patient and increase the disorder.

From the idea I have taken up of the cause of gangrene, the principal attention in the treatment should be directed to regulate the powers and action of the constitution and part.

If in a person of a strong and vigorous constitution a mortification supervene, the inflammation which precedes it may be so violent as to go on destroying the parts it affects; and if a separation of the dead part has taken place, the actions of restoration may be more violently carried on than the new formed parts are able to support.

In such circumstances all irritating applications are to be avoided, and we must endeavour to moderate the actions of the part. Preparations of lead have been found advantageous for this purpose. Mr. Hunter was of opinion that this metal produced a great degree of contraction in the vessels, and was therefore calculated to counteract inflammation, and was of service when there was great power in the part, but that it was injurious when there was little power, as, although it diminished the action of inflammation, it weakened by the contraction it excited. I have seen the pain and irritation which attend a spreading mortification considerably abated by the local application of opium; either the powder or the tincture sprinkled on a poultice, or the poultice made with a decoction of the white poppy. The most effectual means we have of abating violent action in a part, is by reducing the action of the whole system. This is most speedily done by blood-letting, by purges, and by depleting medicines in general; and we may keep the system in this quiescent state by low diet. The good effect of such a plan was exemplified in a case treated by my friend Dr. De Wees.—A young man of a strong constitution was seized with a bilious remittent fever, which after fourteen days took on the form of typhus, for which

bark, wine, and blisters were administered. On the 17th day from the first attack, Dr. De Wees was called in. The patients pulse was quick, irregular, and tense, and the sores occasioned by the blisters, were quite livid. The bark and wine were omitted, the patient was bled, purged, and all applications to the blistered parts were left off. The following day he was better ; but his pulse continuing tense, he was again bled, and purged with calomel and jalap. He continued to mend ; the livid appearance from the blisters had disappeared, and the sores were highly inflamed. He was once more bled ; the fever left him a few days after ; his sores healed kindly, and he perfectly recovered. Here, from a state of most violent action, by removing the irritating cause and lowering the system, the actions of the part retrograded first to that of great inflammation, and at length to that of inflammation simply necessary to restore the part.

If on the contrary gangrene takes place in a person whose strength has been greatly lowered by previous disease, or impaired by particular modes of life or in one whose powers are diminished by age, we must carefully avoid exciting in the part actions it would be unable to support, and our principal object must be to give strength and vigour to the system. This is no less difficult than it is desirable.

It does not appear to me that observations and experiments have yet ascertained what are the substances calculated to produce exclusively this effect. Besides, the power of converting matter into nourishment, and of acquiring strength, depend upon operations of an animal which we have not under our command, and when the whole system is deranged, the functions of digestion and nutrition partaking of the general derangement, less readily and properly perform their necessary office.

Of the medicines however recommended for this purpose, the Peruvian bark is the principal, and long and general experience seems to ascertain with certainty, that it possesses some efficacious qualities to answer this intention. It undoubtedly appears to increase the strength, without increasing the action so much as many medicines given for the same purpose. It has been supposed to have more than ordinary powers in overcoming gangrene, but its extraordinary reputation has been probably owing to many equivocal cases, which recovering when it was administered, the event has been attributed to the medicine, as almost universally is the case in all the diseases whose causes and effects are imperfectly known. Mr. Quesnay informs us, that experiments in France have not confirmed the high opinion entertained of it in England. The preparations of iron

have also been recommended as giving strength to the constitution, but their principal and evident effect is to increase greatly the action of the arterial system, and according to the ideas stated of mortification may produce considerable injury, and are not at all likely to be of any service. Cordials of every kind are very generally employed in cases of gangrene. Mr. Hunter was of opinion that in such cases, they seemed to do harm by increasing the action of the arterial system without giving strength. Many practitioners however of learning and experience maintain that wine is a very useful medicine, particularly in hot climates. It is probable I think, its good effects may greatly depend upon the habit which has been acquired of drinking it. Others on the contrary reprobate the practice altogether. Mr. Quefnay says, the unsuccessful use of cordials is so ancient and so universal, that it is impossible not to be sufficiently convinced by experience of their inefficacy.—Nevertheless, for want of other remedies which have a better title to our confidence we continue to employ them, and we lament at the same time the fate of our patient, who is reduced to depend on so precarious a support \*.

\* The analogy between the blood and the living solids, though admitted by many, is still denied by some Physicians, among whom indeed are to be found superior talents, penetration, and judgment.

We have said that inflammation under certain circumstances, was an action by which some good purpose was to be answered, but we have likewise endeavoured to shew that by its excess, death of the part affected took place.

Many facts however lead to a belief, that there are certain kinds of inflammation which destroy from some peculiar quality, as in the small-pox, where the parts which inflame always die. From this peculiarity they have been termed specific diseases, as it referred them to certain substances which seem to

It is proved by the experience of Dr. Sydenham, and of those who, like him, appear to have accurately observed the operations of the animal machine, that the violent action of the arterial system in malignant disorders, and also in disorders not malignant, but which are treated by cordials, stimulating applications and heating medicines, produces a derangement in the blood, by which it is more readily effused forming purple spots and livid eruptions, and by which it loses the property of coagulating on being drawn from the blood-vessels, and of affording nourishment to the solids. These circumstances have been considered by some, as proofs of a putrid diathesis prevailing in the living body; and this supposition, while it gave a name to the preceding disorder, led to a mode of practice established on as good a foundation as that of pickling and preserving the the living solids. The alteration the blood undergoes, as well as the circumstances which precede it, bear considerable analogy to gangrene of the solids. This analogy is presented to the mind by the term "gangrenous state of fever," which has been so expressively chosen by Dr. Rush, to designate this termination of violent action in the arterial system.

give a peculiar irritation, or to excite a peculiar action in a living animal. There are other specific inflammations familiar to us beside the small-pox, as the venereal disease the carbuncle, and the cancer, although the action of each is particularly modified. The inflammation in small-pox for example, ceases after destroying the part where it began; in the venereal disease, it would contaminate and destroy almost every part of the body, had we not a medicine by which its ravages can be stopped and counteracted; the carbuncle affects particularly the skin and cellular membrane; the cancer attacks principally glandular parts, and propagates itself so effectually as certainly sooner or later to extinguish life. The only remedy we know is to separate the part affected from the rest of the body; this at any rate is a dangerous, and too often a precarious relief. It is said a citizen of Pennsylvania knows a cure for this disease; if true, humanity, patriotism, philanthropy, demand it should no longer be a partial good.

Mortification sometimes occurs from a specific inflammation, which cannot be referred to either kind enumerated, and which requires a particular mode of treatment. The following case which I had an opportunity of attending myself, appears to me of this kind. A gentleman aged 30, enjoying generally good health, for two or three years

ſucceſſively had ſmall pimples break out on his face, which ſoon diſappeared. In the month of February after dancing, he perceived a ſmall pimple in his left groin. This increaſed in ſize, inflamed, but gave little pain. He applied to his Apothecary who treated it very lightly. A ſcab formed, which falling off left a ſore with an irregular edge and inflamed margin. He in March began the uſe of mercury both internally and externally, from a ſuppoſition it might be venereal, and the ſore mended ſo much that he expected it would get well. It however after ſome time became worſe. The mercury was uſed to ſalivation, and continued at intervals for five months, but the ſore having now ſpread conſiderably, he in Auguſt came to London to conſult Mr. Hunter. The extent of the ſore was from the ſpine of the os ilium to the tuberoſity of the iſchium, and from the groin to within two inches of the os ſacrum, being nearly circular. In the centre were ſeveral ſpots healed, but the circumference was irregular and ulcerating, with an inflamed border extending about the tenth of an inch beyond the ulcerating part. His health was conſiderably impaired.

The firſt idea taken up was that of allowing a ſcab to form, imagining the ſore underneath might heal; but although a thick black ſcab formed from

exposure, it still continued to spread. Powder of rhubarb and columba were successively applied, but gave great pain and produced no advantage. Pitch, unguent. saturn. liniment. arcei, were also tried without success. The sore still continued to spread, he lost his appetite and became hectic. He was ordered the tincture of Peruvian bark with the acid elixir of vitriol, and occasionally took an opium pill. Several sores of different sizes appeared in October on his face, head, and arms, having a thick black scab. The idea was now taken up, that this was a specific inflammation which would continue to destroy all the parts it affected, and it was determined to remove with the lunar caustic the whole edge of the sore, that all the diseased part being separated, a new action that of restoration might take place. This was done with very good effect, some parts yielding in four or five days and putting on a healthy granulating appearance, others not for seven or eight, and some even required the application of the caustic for a fortnight regularly. His health was much mended from the use of bark, but he remained still low and weak, and as the disposition to form these sores still continued, for there were several on his arms and head, cicuta was ordered, and a cicuta poultice was applied to a sore on his arm. The medicine in a few days affected his head, and he

complained of giddiness and pain attacking him suddenly. The sore on his arm becoming worse, caustic was applied to the edges of it, which in three days put on a healthy appearance. In the beginning of November, he was so much recovered as to be able to take exercise in a carriage. The sores were dressed with a weak solution of lunar caustic, under which they healed considerably. The unguent. citrin. was then applied, and he was so well as to return above one hundred miles into the country in the middle of November.

In this case it appears evident, that from the quantity and length of time mercury was administered, it could not cure this disease. It would also seem that the recovery in some degree of his health and strength from the bark, was incapable of stopping the progress of the sore, and the cicuta appears to have been totally inefficacious. But by removing the diseased part, the cause of contamination seemed to be taken away, and the sore healed. It is however singular, that the sore which had been touched with caustic should heal, while others of a spreading disposition broke out in different parts of the body. Mr. Hunter said he had seen such sores before, where this kind of inflammation with respect to the parts affected, resembled the small-pox with respect to the constitution, which having once undergone the action

of the poison, lost the disposition to this action. This opinion was strengthened by the small islands, if I may so express myself, which had healed in the centre of the fore, while the circumference continued to spread.

A case somewhat resembling this occurred last year in Philadelphia. Dr. Physick had taken up a similar idea of the mode of cure, and had applied the lapis scepticus to a very extensive spreading ulcer. The success in this case also, was equal to the expectation formed.

The summary then of my idea of Gangrene and Mortification is, that it is the total extinction of the life of a part. That it is of two kinds, one without inflammation, the other preceded by it. The first is the consequence of the circulation being stopped, and of great violence. The treatment of this kind is the most simple, the powers of the animal machine being for the most part sufficient to remedy the disorder. Of the second kind, or mortification preceded by inflammation, there are two species. The first is produced by the action of inflammation exceeding the powers of the part to support; and the treatment consists in preserving the equilibrium between the powers and action. The second species is the consequence of a specific inflammation, which is to be

treated by medicines experience has proved capable of counteracting the peculiar diseased action, or by separating the contaminated part from the sound.

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Med. Hist.

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